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ABSTRACT

This study focused on potential overall differences in predicting mathematics and reading achievement among various immigrant groups. The dataset for the study, the sample from the Second Generation Project in Miami, Florida, and San Diego, California, was composed of 5,267 second-generation immigrants in grades 8 and 9. The results from two different regression analyses suggest some differences among the psycho-cultural and ethno-cultural group predictors for reading and mathematics that are of both statistical and practical significance. Although there were some similarities, the predictors of reading achievement tended to be more affective in general when compared to those for mathematics achievement. With respect to ethno-cultural group differences, the results suggest that group differences are also significant and follow a similar pattern for both content areas. However, more importantly, these differences are dependent, to a large extent, on both psycho-cultural and demographic variables. (Contains 3 tables and 44 references.) (Author/SLD)

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Differential Predictors of Mathematics and Reading Achievement: What May Be Learned from Immigrant Adolescents' Adaptation to School

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Abstract

Ethnic group differences in reading and particularly in mathematics achievement have an expanding literature. The initial findings of this study concern potential overall differences in predicting mathematics and reading achievement among various immigrant groups. The data set that serves this study is large and composed only of recent immigrants (8^{th} and 9^{th} grades). The results from two different regression analyses suggest some differences among the psycho-cultural and ethno-cultural group predictors for reading and mathematics that are of both statistical and practical significance. Although there were some similarities, the predictors of reading achievement tended to be more affective in general when compared to those of mathematics achievement. With respect to ethno-cultural group differences, the results suggest that group differences are also significant and follow a similar pattern for both content areas. However, more importantly, these differences are dependent, to a large extent, on both psycho-cultural and demographic variables.

Ethnic group differences in reading and particularly in mathematics achievement has an expanding literature that often points to the role of specific demographic and psycho-cultural factors. As well as a variety of historically determined contextual variables that could explain the achievement differences, other factors may be manifested through a variety of socio-psychological characteristics of students and their communities (Portes, 1999; Neisser, 1986; Trueba, 1988). Many aspects seem to interact in determining the compatibility between students' native culture and that of the dominant groups' with respect to adaptation to school. Noted among these are parent or student beliefs, attitudes, goals, routines, family, and societal factors (Tharp, 1989; Whiting, 1976). The social capital available to students, their cultural of origin and history, and the socio-educational context that serves them, also appear as critical factors, which along with social economic status (SES) and individual agency, are linked with group differences in school outcomes (Portes, 1999).

Perspective/Theoretical Framework

The educational achievement of immigrants is of particular interest to social science and educational policy concerned with the issue of inequality among U.S. mainstream, and non-immigrant groups. Why these children are situated at risk for educational and social disadvantages, despite sensitive school-based or community interventions, remains a critical problem in education. On the other hand, children from some cultures appear to have certain advantages or protective factors in the educational marketplace (see for example Moore & Stanley, 1987). In considering ethnic differences in school achievement, why such a contrast exists is puzzling. Various explanations for today's disproportionate rates of drop outs, grade retentions and lower achievement among specific ethnic groups may be found in the literature (Council of the Great City Schools, 1995; Foley, 1991; Fulgini, 1997). These explanations or hypotheses are generally subsumed under three main categories: the culture of origin, the way schooling is structured, and their interaction (Mehan, 1992; Oakes, 1990; Ogbu, 1989). A fuller description of these accounts may be found elsewhere (Portes, 1996) which includes attention to family and individual agency.

Ethnicity is often associated with differences in SES, educational performance, and a variety of psycho-cultural outcomes. Yet, two types of cultural differences merit distinction: those concerning national subcultures and those concerning immigrant and second generation immigrants with respect to educational and occupational status.

Considerable variation can be found among groups of students from historically disadvantaged minority groups compared to established Euro-American students. Several explanations for the low achievement of the former are often centered on schooling practices, others on macro-level social and economic factors. Labels are often used in ways that are not always in the interest of their bearers, leading to class and ethnic separation in opportunities to learn and limited educational futures (Portes, 1996; Oakes, 1990). Yet differences in achievement between immigrant minority and established groups pose some problems for those who blame schools for the achievement gap.

Various models have been developed to account for group differences in school adaptation that are based on students' culture. For example, Native, African, and Mexican-Americans, share a history of oppression and cultural subordination (rooted in colonialism) that has been institutionalized. They may be regarded as colonized or as involuntary minorities (IVM) (Ogbu, 1991). Immigrant groups, on the other hand, adapt differently, although they may also be poor, encounter language difficulties and suffer discrimination. The folk psychology of immigrants (their interpretation concerning unfavorable conditions and of the host society) along with their self-regard, values, and motives, may differ from those of domestic, impoverished minorities. This may lead to what has been popularly characterized as the "immigrant edge." The longevity of this immigrant edge of some groups' students may well disappear in time but remains an empirical question. The conditions that are necessary and sufficient to produce or eliminate this edge constitute an important research question. More research is needed in linking socialization patterns and contextual factors with respect to the development of school aptitudes.

Variations in achievement motivation regarding school and occupational success, as well as differences in communication, perceived and felt discrimination, and self-esteem, may be co-constructed as part of the cultural adaptation process. With respect to immigrant students, the extent to which students adapt in ways akin to those majority or minority groups are not fully understood. Only a few disparate studies can be found in this area that consider the educational achievement of children from diverse cultures (see Gibson and Ogbu, 1991; Matute-Bianchi, 1986; Portes & MacLeod, 1996; Rumbaut, 1994; Suarez-Orozco, 1989; Wang & Goldschmidt, 1999). Beliefs, such as learned helplessness, effort optimism (Ogbu, 1992), self-esteem, achievement motivation, or study and TV habits, may be related to different culture-based models of success. Students from these groups tend to be more optimistic about succeeding in U.S. society (Suarez-Orozco, 1989) and to enjoy greater family

support than involuntary group students. However, while some find the above evidence as supportive of a static topology model, others point to their social capital and mediating factors concerning the social context in which these groups are received, which might provide a more succinct explanation (Tharp, 1989; Trueba, 1988). The political and economic situation of a host country changes over time, often making the adaptation to school more difficult for immigrants. The influence of different contexts of reception, of secular, economic and political trends, also might require attention in this regard. A theoretical cultural-historical (CH) approach would focus on differences to access key mediational tools and activities such as language, pre-school, after school programs and such. These might imply differences in terms of the demands for literacy posed by reading and mathematics among other content areas.

It is not clear whether or how the above factors relate to academic achievement, particularly when larger and more diverse groups are considered. The roles of parental SES, ethnicity, self-concept, achievement motivation, and other variables need to be disassembled in explaining achievement differences. The extent to which the above factors constitute what is often regarded as the effect of ethnicity remains unclear. The study of immigrant group differences in educational outcomes thus would seem to provide fuel for theory development and contribute to educational policy and practice.

Reading and Mathematics Achievement

From a growing literature relating demographic and psycho-cultural variables to reading and mathematics achievement, it has been noted that, among mainstream groups, the antecedents of reading include early-age reading and the language literacy environments of the home (Quatroche, 1999). Children who have access to "better" cognitive supports or who live in a "literacy environment" (Sulzby, 1994) develop more capital in school (Snow, Burns & Griffin, 1998). Social and emotional benefits surrounding literacy events in the home appear of import (Lancy & Burgin, 1992). Predictors of reading and English literacy in immigrant populations include higher cognitive ability in the native language (Willig, 1985; Wong-Fillmore & Valadez, 1986). Literacy is seen to lead to overall academic achievement (Bankston & Zhou, 1995). Yet mathematics achievement has generally been regarded as less culturally-weighted, and the achievement gap tends to be smaller in this content area. Among immigrant students, there is some indication that literacy may lead to increased achievement in mathematics (Wang & Goldschmidt, 1999), as immigrant students had higher achievement levels in

ESL math classes. In should be noted that the predictors of mathematics achievement are derived generally from studies of ACT, TIMSS (Third International Mathematics and Science Study) and Census Bureau data. Such predictors include SES (Signer, Beaudry, & Bauer, 1995), parental education and TV viewing (Beaton, 1996). In studying minority achievement, Peng & Wright (1994) noted the SES, parental education, home literacy, parental unemployment and an inner city school connection with mathematics achievement. The antecedents of mathematics achievement require more study particularly research that combines demographic with psycho-cultural predictors and with groups that vary in their English language proficiency.

Other Perspectives

There is little evidence to presume that immigrant youth are homogeneous with respect to school adaptation and that their achievement in school in anchored in a set of common beliefs and practices. Many of the alleged group differences with regard to minority achievement found in the literature come from studies that do not contrast different immigrant groups across school content areas after controlling for SES and language proficiency in English or content areas in school. The extent to which membership in a culture remains significant after other potentially mediating factors are taken into consideration remains an essential question in the field.

Of the studies that are currently in the literature, few evaluate contextual and psycho-cultural characteristics. Many are based on the data from NAEP and TIMSS which have different goals and predictors (Howie, Marsh & Allummoottil, 2000; Schumer, 1999; Jakwerth, 1999; Casey, Nuttall & Pezaris, 2001) . The current study includes many of the same factors and others such as an English proficiency index, SES, achievement motivation, study routines and the Rosenberg (1979) self-esteem scale to name a few. Additionally, the effects of demographic features such as SES, gender and bilingualism are examined in relation to variations in mathematics and reading achievement.

Importance of the Study

The data set that serves this study is large and composed only of recent immigrants. It provides an important baseline for contrasts of what are the main factors that distinctly predict reading achievement from that of mathematics that may be less English dependent. This study sheds light on an issue that has gone largely unexamined, that is, the demographic and psycho-cultural predictors of immigrant adolescents' achievement in discipline specific areas (mathematics and reading). The effect

size is likely to remain reliable under a variety of conditions and adds confidence to research in this emergent area.

The following research questions are of particular interest in this exploratory study: What are the main predictors of mathematics and reading achievement with respect to immigrant youth as a whole after accounting for SES, gender, and English language proficiency? How are the predictors of reading and mathematics different and how may they be related to the process of cultural adaptation? What are the educational implications for students and teachers if reading/mathematics predictors are different? To what extent can these findings be used to inform educators working in ESL as well as mainstream settings? In other words, is the net effect of ethno-culture significant beyond socio-psychological and control variables in this population in predicting reading achievement?

Hypotheses

Given the segmented, cultural context adaptation model proposed in an earlier report (Portes, 1999), it is predicted that amongst a "voluntary" or immigrant sample, significant group differences would be found in reading and mathematics. Secondly, it is predicted that a significant amount of the variance in achievement can explained by psycho-cultural factors after demographic variables are controlled.

Method

The data for this study stem from the Youth Adaptation and Growth Questionnaire developed for the Second Generation Project in Miami and San Diego (Portes & McLeod, 1996). A full description of the design of the study, sampling, and procedures can be found in Rumbaut (1994). A total of 5,267 second-generation students from various groups were interviewed. According to the author, second generation status for children was defined as living in this country (U.S.) for at least five years or being the child of at least one immigrant parent. By limiting the sample to eighth and ninth graders, the bias created by school dropouts in the higher school years was reduced. This is a time when most children are still in school. One-half of the sample participants were born outside the U.S. before age 12. The

other half was U.S. born. The sample was also evenly distributed by grade and gender.

Children from 77 different nationalities and 42 different schools in Dade County (Miami), Broward County (Ft. Lauderdale) (N>2800) and the San Diego metropolitan area (N>2400) were interviewed using the survey tool. The total participants in the study were 5,264. The study accessed school records thus allowing researchers to match the characteristics of the respondents (nationality, sex, age, parental education, length of U.S. residents and aspirations) with their school performance.

Sample Selection

Students were foreign-born or had at least one foreign-born parent. A brief initial survey of all eighth and ninth graders in the school districts indicated above was conducted in order to locate participants. Parental consent was obtained for all eligible participants. The return rate was 67% of the South Florida group and 75% for the San Diego group (Rumbaut, 1994). The nationalities represented included: Cubans in private school, Cubans in public school, Mexicans, Jamaicans, Haitians, Latin Americans (including Nicaraguans and Colombians) and Filipinos, as well as South East Asians such as Vietnamese, Laotian, Cambodian, Hmong, and Thai. Smaller numbers of the following groups participated: Chinese, Japanese, Korean, Indian, Asian/Middle Eastern, and other Asian. Only the first eight groups had numbers that were sufficient to allow for the multivariate analyses that follow.

General Measures or Control Variables

Data on the respondents' demographic characteristics were provided by the survey: nativity and citizenship of both respondents and parents, family size and structure, socioeconomic status including parents' education level and occupation, and home ownership.

Control variables included: grade, age, gender, English language proficiency (EPI), inner city school, length of stay in the U. S. and parental SES. Since those in the earlier grade were more recent immigrants and generally were less bilingual, grade could be seen to index indirectly cultural adaptation.

Psycho-cultural Measures

A collection of attitudinal and other psychosocial variables were analyzed and subjected to data reduction schemes. As defined in an earlier study (Rumbaut, 1994), measures of depression, familism and self-esteem were included. A familialism scale assessed the strength of family bonds (FAMSCA, alpha=.56). Self-esteem from a ten-item Rosenberg scale (Rosenberg, 1979) (ROSEN, alpha=.81), and depressive symptoms from a four-item subscale from the Center for Epidemiological Studies-Depression (CES-D, alpha=.74) were used and have been found in the past to be predictive of major depression among adolescents (Vega and Rumbaut, 1991).

Measures Based on Factor Analysis

From selected interview items, several measures were developed through factor analyses. One analysis yielded a scale measuring perceived discrimination (alpha=.54), another indexed felt discrimination (alpha.98), and a third factor analysis represented an achievement motivation scale (alpha=.69).

Variables dealing with adaptation to the American culture and to the ethnic culture were evaluated. A student's cultural development, for example, could be revealed through choice of language in daily routines, his/her parent's own cultural identification and attitudes and perceptions concerning American culture. To examine these constructs of cultural identity, a factor analysis of twelve such variables was conducted. A bipolar factor was hypothesized that would range from preferences for American to natal ways. A two factor solution was found to be more tenable, accounting for 49% of the variance. The first factor served to index the respondent's ethnic identification and adaptation. It was related to the "Pull" of the native culture on the individual and the extent to which the respondent's natal language was maintained. The factor also served to measure the respondent's native language proficiency and the parents' use of the native language. The second factor contained variables related to adaptation to the American culture. This factor served to examine the parents' cultural adaptations and the respondent's assimilation into the mainstream of America. The first factor was dubbed "Ethnic Pull" (alpha=.80), and the second factor, "American Pull" (alpha=.66),

was so named to reflect adaptation to the American way of life. These factor scores were used in subsequent statistical analyses.

Other Predictor Variables

Other variables were considered. These included a variable called SES that reflected the family's socio-economic status at present compared to five years prior. The number of hours spent daily on homework and television. Respondent's peer relationships were examined as to the total number of friends and the number of friends of similar ethnic background. Other variables were included in the subsequent analyses: limited English proficiency (LEP), performance on standardized reading and mathematics achievement tests and a combined score (ACHTOT), and father presence in the home.

Data Sources/Method

A prior study with this data set (N =5000), examined the relative importance of such variables on the academic achievement of immigrant adolescents from 28 nationalities (Portes, 1999). Generally the findings supported the view that demographic variables, such as SES, do account for some of the variation in academic achievement, however psycho-cultural variables were most important. The current study, will examine the effects of demographic/control and psycho-cultural predictors on mathematics and reading achievement. Two regression models will be used and the results related to theory and the extant literature.

Results

The initial findings of this study concern potential overall differences in predicting mathematics and reading achievement among various immigrant groups. An earlier paper in this series examined Asian-origin and Spanish-speaking group differences in reading achievement based upon regression predictors (Portes & Zady, 2001). In the current paper, the sub-groups from above were disaggregated and other groups were added to determine group-based differences in the means of reading and mathematics achievement tests (see Table 1 for means and N's by gender). Subsequently two regression analyses, one for reading achievement and one for mathematics achievement were conducted using the above variables in three blocks or models. The first block contained demographic/control variables.

The second block contained psycho-cultural variables, while the last block contained ethnic group variables. The results from two different regression analyses suggest some differences among the psycho-cultural and ethno-cultural group predictors for reading and math that are of both statistical and practical significance. The variance explained in reading scores was higher (39%) than that for math (32%) mainly because a number of psycho-cultural factors proved significant. The latter tended to be more affective in general. Most of the variance was explained by the first block of control variables.

In an effort to determine how much of the variance in reading was explained by just the psycho-cultural factors, the order of entry was reversed, the psycho-cultural variables entered as the first block and this block now accounted for 26% of the variance in reading, while the control block influence was diminished to 10%. Again alternating the order of entry, the psycho-cultural block accounted for 19% of the variance in math, and the control block represented 9% of the variance. Therefore, overall differences in mathematics and reading standardized scores were explained mainly by demographic and psycho-cultural factors relative to ethno-cultural group differences. The following is a summary of the findings based upon the regression variables (Table 2).

Control Block

Overall, 19% of the variance in mathematics and 28% of the variance in reading achievement were explained by the first block of control variables shown in the model ($p = .000$ for both blocks) (Table 2). The important control predictors for mathematics included grade, English proficiency, SES. Inner city school was a negative predictor as was age. Age and grade allowed for control of sample characteristics in which some older students in 9th grade tended to be lower in achievement as a group than eighth graders, who also were least likely to have been retained. Except for the length of stay in U.S. variable's positive effects on reading, the other variables in this block were similar in predicting achievement in both content areas.

English proficiency (EPI) was controlled in order to level the sample with respect to important differences in acculturation and mastery of a second language. Considerable variation existed in terms

of this factor and once controlled, allowed for the importance of the other measures to be studied. EPI was found to be 3 times more important for reading than for math achievement. Parental SES significantly predicted achievement in both content areas almost equally. Inner city schooling was also found to be a significant negative predictor of achievement in both areas.

Psycho-cultural Block

After controlling for age, grade, SES, English proficiency, inner city status (all significant for both groupings) and length of stay in U.S., several psycho-cultural factors appeared important for this immigrant sample as a whole. For math, 11 of these predictors were found to account for 9% of the variance ($p=.000$). In reading, 13 predictors were found that accounted for 8% of the variance given that these were entered as the second block ($p=.000$).

Major positive predictors for math were: Achievement motivation, self-esteem as measured by the Rosenberg scale and time spent on homework. The latter also were major positive predictors for reading. As Table 2 shows, Familialism and Perceived Discrimination were predictive of lower scores in both areas. Other negative predictors for both math and reading were economic situation five years prior, television viewing, number of close friends, and the pull of the American culture.

Two predictors were unique and supportive of mathematics achievement: father presence and number of friends from abroad. Five predictors were particular to reading achievement. Those with negative influences were felt discrimination, the pull of the ethnic culture and limited English proficiency. The length of stay in the U.S. and increased scores on the depression scale were predictive of higher reading achievement. The longer the student has been adapting to U.S. culture, the higher the reading achievement as expected. The latter association of increased depression and increased reading achievement is an unanticipated finding.

Ethnic Group Membership

With respect to ethno-cultural group differences, the results suggest group differences are also significant and follow a similar pattern for both content areas ($p=.000$ for both blocks). When the order

of entry was changed and the ethno-cultural block was entered first in the two regressions, it was found to account for 13% of the variance in achievement scores. However, the most impressive findings of the study concern the fact that differences in group membership are dependent, to a large extent, on both psycho-cultural and control variables. Hence, what appear as large group differences in achievement in both content areas often disappear completely or change. Some ethnic group differences remain important conceptually although the variance accounted for them is minimal after other factors are controlled. (See Table 3 Significant Differences in Reading and Mathematics Achievement by Ethno-Cultural Groups. The adjusted means in this table have been obtained through regressions by entering each ethno-cultural group one at a time as the reference groups in the third block.)

When used as the reference group, the private-school Cubans were found to score significantly higher that all the other groups after controlling for the two blocks of variables noted above except for South East Asians in mathematics and Filipinos in reading. In reading, public-school Cubans scored significantly above Haitian, Latin American and Jamacian groups. In math, this group was significantly above Jamaican, Mexican and Haitian students but significantly below Southeast Asian and private-school Cubans.

Haitians scored above Jamaican students in reading but below Filipino and private school Cubans, They scored above all groups in math except private Cuban, Filipino and Southeast Asians. Latin Americans scored significantly above Haitians and Jamaicans and below private-school Cubans and Filipinos in Reading. They were significantly below South East Asians in math but above public-school Cubans, Haitians, Jamaicans and Mexicans. Jamaicans were found to score significantly above the Haitian, public-school Cubans and Latin Americans in reading and math as well as above the Mexicans in math.

Mexican students were found to score significantly above public-school Cubans, Haitian, Jamaican and other Latin American groups in reading and math. In math they were found to score significantly below the Southeast Asian group.

Southeast Asians scored significantly higher than all other groups except private-school Cubans and Filipinos in reading. The same was true for math except they scored higher than Filipinos once all other variables in the regression were controlled.

Filipino students scored significantly above all groups except private-school Cubans and South east Asians in reading and math. The rest of the group differences are shown in Table 3 for adjusted means.

Other Patterns

The most important predictors in the second block (psychosocial variables) for reading were self-esteem, perceived discrimination, achievement motivation, time spent on homework, number of friends and familialism. For mathematics, these too were significant but achievement motivation was somewhat more important.

The more identified students were with their native culture, the lower the reading scores. Conversely, the more identified they were with American culture, the lower the scores in both reading and math. Their report of hours of TV viewing was also associated with lower performance overall. Students' perception that things were better economically five years before also was predictive of lower performance in reading and math.

A number of predictors were unique to reading achievement. Reported discrimination and being identified as limited in English proficiency significantly predicted lower reading scores but not math. For math, having father live at home and the number ethnic friends were predictors of achievement in math but not reading test performance. Interestingly, higher scores on the depression scale were predictive of better reading performance.

Discussion

The present study sheds new light on many of the assumptions found in the literature concerning cultural differences within and between groups. Within the immigrant student population, there are various interpretations regarding the role of class, context and language in case studies or ethnographic

studies, as well as others with more limited samples. Oftentimes, this population is regarded as homogeneous relative to mainstream and involuntary groups (Portes, 1999; Ogbu, 1992). The role of ethnic identity, with respect to acculturation and other affective factors has been difficult to separate from other conditions that generally remain unmeasured or not controlled. The analyses presented here allow for several conjectures about the role of psycho-cultural influences after major differences due to static factors are controlled and discerning the prevailing influence of ethno-cultural membership. In general, although many of the same variables predicted reading achievement as an index of literacy acquisition compared to mathematics, many tended to do so to differing degrees while others were specific to the subject area in question. Hence the first hypothesis seems supported.

After class, gender, grade level/age and English proficiency are controlled, a number of interesting measures were found to account for reading test performance. The latter may be regarded as indexing the literacy level and potential that these students have in adapting to mainstream culture, and perhaps indirectly, their efficacy in dealing with the host culture.

The results suggest that two psycho-cultural factors were significant in predicting reading and mathematics achievement. Family-centeredness (Familialism) is an orientation that appears to denote a certain dependency which is predictive of lower achievement. Students who are so identified with their families and see their future as centering on being close to the family tend to have lower achievement. Those who report willingness to move away when they are older have higher achievement. This finding is of particular importance for this population since the process of individuation, development of cultural values and beliefs are to be contextualized with both adolescence and a time of cultural adaptation simultaneously. Self-esteem, as expected, had a modest but significant effect on performance. High self-esteem is likely to be an index of overall psychosocial adaptation.

On the other hand, test performance was negatively influenced by perceptions and experiences of discrimination. Again these two factors represent an added agenda for immigrant as well minority students in general that emerges during this time and can have influence on the type of adaptation of

these adolescents. Television viewing and number of close friends had a negative effect in both subject areas. While these three factors contribute independently to lower achievement, the larger picture seems one in which they are interconnected as part of an overall pattern of adaptation.

For these immigrant groups in particular, the ethnic pull factor that reflects maintenance of the native language and general family support of the culture of origin had a significant negative influence on reading achievement. The latter factor captures some of the added stresses adolescents must experience as they attempt to negotiate their identities amongst family, peers and two cultures. Similarly, the American pull factor had a negative influence on reading and math achievement. This factor also indexes adaptation but more towards American culture. In both cases, regardless of the direction, this added task of cultural adaptation that reflects language practices and parents' own adaptation seems to weigh in ways that, relative to the mainstream culture, detract from students' focus on achievement. A somewhat unexpected finding is that increased scores on the depression scale were related to greater reading proficiency.

In spite of the fact that this sample was bilingual for the most part, and that English proficiency differences were controlled, being classified as Limited English Proficiency had a minor negative effect on reading achievement. It is possible that such students' literacy development in both native and English may limit comprehension and related skills required to do well on a reading test. Overall, it appears that test scores are predicted by a number of factors that are interrelated in both practices and affective domains (particularly in reading), and that reflect differences in students' adaptation.

Hence, one final conclusion is that reading achievement is particularly sensitive to a host of underlying cultural and family adaptation processes. What is required to do well in this content area is much less culture-free than in other areas such as math or computer literacy although reading is still required for these subject areas. What is required for success in reading appears to involve complex, outside of school factors that, for immigrant students, including cultural adaptation processes. In the case of math, father presence is important and reflects the parental involvement needed in general from

intact families. Additionally, mathematics achievement seemed to be reinforced by having friends from one's own ethno-cultural group.

A number of limitations are important to note concerning this study. While one of the strengths of the study lies in being able to unpack pan labels regarding culture by examining particular groups, it should be noted that the Filipino groups' identity is unique in its heritage of Spanish, American and native culture. In the case of the private-school Cubans, in spite of the statistical control of parental SES in the control block, it may be that other class and historical factors distinguish this group from other immigrant groups. This group poses a slight problem due to the missing female cell that perhaps influenced the gender-effect. This same sample also includes with it the effect of private schooling and religious denomination. Finally, some groups were small in number and affected the generalizability of the study for some groups.

The controlled factors influence achievement in the expected direction. After sample characteristics were adjusted by the variable grade in order to make comparisons more accurate[1], English language proficiency, a major index of literacy in general, accounted for about twice as much variance as parental SES in reading. Another potential bias was controlled in this immigrant sample by taking into account differences in school location , that is inner city versus others. As a result of these controls, greater confidence was placed on the role of psycho-cultural factors that are often generally included in conceptions about particular ethnic groups.

In conclusion, the present research presents essentially a baseline for various factors found in the literature regarding the links between school and cultural adaptation of immigrant students. As argued in a related report (Portes, 1999), the assimilation of these second- generation students is not linear or stage-like but depends on different constellations of context and inter-cultural factors. These interpretations remain guarded in recognition that the data provide essentially a snapshot of a much

[1] Some of these students had to repeat a grade due to language and prior school experiences. As a result, those in the 8th grade tended to achieve at a different level than those in 9th systematically. Controlling for this factor allows to explore the other variables after reading performance is adjusted for this grade bias.

longer and complex process of adaptation. However, the study is unique in that its design and methodology allows for important questions and findings to be part of a growing literature that is pertinent to educational policy in an increasingly diverse society.

While the anticipated divergence in the predictors of mathematics and reading achievement was encountered, the most impressive findings of the study concern the fact that differences often attributed to ethnicity, culture or group membership are dependent, to a large extent, on both psycho-cultural, context and control variables. Hence, what appear as large group differences in achievement in one content area often disappear or change considerably. Finally, it may be that the traditional question of which group achieves better in school may be the wrong question. Rather, questions concerning the interplay and role various factors play for different groups in different contexts appear more useful. A preferable analytic strategy seems to extend the present research toward the study of specific ethno-cultural groups and contexts.

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Table 1

Reading and Mathematics Scores by Ethnicty and Gender

		Group											
		PRICUB			PUBCUB			HAITIAN			LATINAM			JAMAICAN		
Variable		Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD
Reading Achievement	Female				.075	500	.49	-.191	91	.49	.026	488	.58	.153	117	.52
	Male	.617	103	.42	.057	409	.57	-.345	49	.46	-.005	411	.59	.102	59	.60
	Total				.067	909	.52	-.245	140	.48	.012	899	.58	.136	176	.55

		Group							
		MEXICAN			SEASIAN			FILIPINO			TOTAL	
Variable		Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	SD
Reading Achievement	Female	-.199	295	.61	-.116	288	.69	.384	373	.61	.047	.61
	Male	-.240	318	.62	-.230	289	.70	.256	361	.58	.012	.64
	Total	-.220	613	.62	-.173	577	.70	.321	734	.60	.030	.62

Note PRICUB = Cubans in private school PUBCUB = Cubans in public school
LATINAM = Latin Americans SEASIAN = South East Asians

Group

Variable		PRICUB Mean	N	SD	PUBCUB Mean	N	SD	HAITIAN Mean	N	SD	LATINAM Mean	N	SD	JAMAICAN Mean	N	SD
Mathematics Achievement	Female				.005	500	.70	-.235	91	.60	.009	488	.71	-.003	117	.80
	Male	.659	103	.52	-.090	409	.73	-.380	49	.58	-.025	411	.75	.096	59	.70
	Total				-.037	909	.72	-.286	140	.59	-.006	899	.73	.030	176	.77

Group

Variable		MEXICAN Mean	N	SD	SEASIAN Mean	N	SD	FILIPINO Mean	N	SD	TOTAL Mean	SD
Mathematics Achievement	Female	-.389	295	.66	.094	288	.75	.356	373	.72	.014	.74
	Male	-.405	318	.68	.036	289	.72	.296	361	.68	-.002	.75
	Total	-.398	613	.67	.065	577	.73	.326	734	.70	.006	.74

Note: PRICUB = Cubans in private school PUBCUB = Cubans in public school
LATINAM = Latin Americans SEASIAN = South East Asians

Table 2

Regressions for Mathematics and Reading Achievement

Predictor	Mathematics		Reading	
Block 1 Demographic/Control	Beta	Sig.	Beta	Sig.
Grade	.243	.000	.168	.000
Age	-.125	.000	-.081	.000
English Proficiency	.070	.010	.230	.000
Socio-economic Status	.095	.000	.124	.000
Gender	.030	.070	.016	.302
Inner City School	-.139	.000	-.093	.000
Length of Stay in U.S.	-.006	.756	.043	.019
Block 2 Psychocultural				
Economic Situation 5 Yrs. Prior	-.050	.002	-.044	.003
Homework Time	.081	.000	.059	.000
Television Time	-.052	.001	-.044	.003
Number of Close Friends	-.049	.002	-.060	.000
Number of Friends from Abroad	.051	.002	.017	.261
Familialism	-.099	.000	-.127	.000
Depression Scale	-.017	.315	.040	.013
Limited English Proficient	.000	987	-.044	.028
Perceived Discrimination	-.093	.000	-.129	.000
Felt Discrimination	-.012	.484	-.040	.009
Achievement Motivation	.113	.000	.058	.001
Ethnic Pull Factor	-.030	.164	-.059	.004
American Pull Factor	-.040	.027	-.046	.007
Father Presence	.054	.001	.020	.200
Self-Esteem Scale	.094	.000	.138	.000
Block 3 Ethnicity				
PUBCUB	-.231	.000	-.178	.000
HAITIAN	-.142	.000	-.157	.000
LATINAM	-.210	.000	-.177	.000
JAMAICAN	-.123	.000	-.121	.000
MEXICAN	-.219	.000	-.124	.000
SEASIAN	-.043	.118	.075	.004
FILIPINO	-.099	.000	-.052	.039
PRICUB as reference group	R square = .318 Adj. R square = .311		R square = .392 Adj. R square = .385	

PRICUB = Cubans in private school PUBCUB = Cubans in public school LATINAM = Latin American SEASIAN = South East Asians

Table 3
Significant Differences in Reading and Math Achievement by Ethnocultural Group (adjusted means)

Reference Group		Groups PRICUB	PUBCUB	HAITIAN	LATINAM	JAMAICAN	MEXICAN	SEASIAN	FILIPINO
PRICUB	Read		-.178***	-.157***	-.177***	-.121***	-.124***	-.075**	-.052
	Math		-.231***	-.142***	-.210***	-.123***	-.219***	-.043	-.099***
PUBCUB	Read	.051**		-.098***	-.036*	-.067***	-.008	.027	.051*
	Math	.038*		-.067***	-.032	-.054**	-.071***	.087***	.030
HAITIAN	Read	.049**	-.025		-.027	-.055**	.001	.040	.062*
	Math	.008	-.117***		-.096***	-.070***	-.122***	.047	-.012
LATINAM	Read	.050**	-.029	-.095***		-.063***	-.003	.037	.058**
	Math	.030	-.062**	-.071***		-.055**	-.079***	.087***	.027
JAMAICAN	Read	.028	-.085**	-.113***	-.083**		-.053	-.003	.028
	Math	-.008	-.164***	-.106***	-.139***		-.166***	.014	-.036
MEXICAN	Read	.030	-.082***	-.118***	-.083***	-.086***		.013	.028
	Math	.022	-.077***	-.076***	-.056*	-.067***		.109***	.032
SEASIAN	Read	.017	-.122***	-.133***	-.120***	-.098***	-.065***		-.001
	Math	-.025	-.219***	-.134***	-.194***	-.115***	-.193***		-.080***
FILIPINO	Read	.013	-.139***	-.141***	-.138***	-.103***	-.087***	-.039	
	Math	-.006	-.172***	-.114***	-.147***	-.092***	-.156***	.021	

* p≤.05 **p≤.01 ***p≤.001

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